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Revision History

This table shows changes to this controlled document over time. The most recent version is presented in the top row of the table. Previous versions of the document are maintained by the SESD Field Quality Manager.

History	Effective Date
<p>SESDPROC-206-R1, <i>Field Equipment Cleaning and Decontamination at the FEC</i>, replaces SESDPROC-206-R0.</p> <p>General Corrected any typographical, grammatical and/or editorial errors.</p> <p>Title Page Changed title for Antonio Quinones from Environmental Investigations Branch to Enforcement and Investigations Branch. Changed Bill Cosgrove's title from Acting Chief to Chief.</p> <p>Revision History Changed "SESDPROC-205-R0, Field Equipment Cleaning and Decontamination, Original Issue" to "SESDPROC-206-R0, Field Equipment Cleaning and Decontamination at the FEC, Original Issue."</p> <p>Section 1.2 Added "the SESD Operating Procedure for Field Equipment Cleaning and Decontamination" before SESDPROC-205.</p> <p>Section 1.3 Updated information to reflect that the procedure is located on the H: drive of the LAN. Clarified Field Quality Manager (FQM) responsibilities.</p> <p>Section 1.5 Alphabetized and revised the referencing style for consistency.</p> <p>Section 1.6.1 Corrected the title of the Safety, Health, and Environmental Management Program Procedures and Policy Manual.</p>	November 1, 2007
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1 General Information

1.1 Purpose

This document describes general and specific procedures, methods and considerations to be used and observed when cleaning and decontaminating sampling equipment at the SESD Field Equipment Center (FEC). For the purpose of this procedure, decontamination refers to the removal of contaminants from sampling, drilling and other field equipment to concentrations that do not impact study objectives

1.2 Scope/Application

Decontamination procedures outlined in this document are intended for use at the FEC for decontaminating sampling and other field equipment. These procedures are not intended to be used in the field. Procedures for use in the field are found in the SESD Operating Procedure for Field Equipment Cleaning and Decontamination, SESDPROC-205.

Sampling and other field equipment decontaminated in accordance with these procedures will meet the minimum requirements for Data Quality Objective (DQO) Definitive Data Collection. Deviations from these procedures shall be approved by the project leader, documented by FEC personnel and discussed with the SESD Field Quality Manager.

1.3 Documentation/Verification

This procedure was prepared by persons deemed technically competent by SESD management, based on their knowledge, skills and abilities and have been tested in practice and reviewed in print by a subject matter expert. The official copy of this procedure resides on the H: drive of the SESD local area network. The Field Quality Manager (FQM) is responsible for ensuring the most recent version of the procedure is placed on the H: drive and for maintaining records of review conducted prior to its issuance.

1.4 Definitions

- Soap shall be a standard brand of phosphate-free laboratory detergent such as Luminox®.
- Tap water is water from any potable water supply. De-ionized water or organic-free water may be substituted for tap water.

- Nitric acid solution (10%) shall be made from reagent-grade nitric acid and deionized water. Nitric acid solutions used to clean equipment cannot be reused.
- De-ionized water: Tap water that has been treated by passing through a standard de-ionizing resin column. At a minimum, the finished water should contain no detectable heavy metals or other inorganic compounds (i.e., at or above analytical detection limits) as defined by a standard inductively coupled Argon Plasma Spectrophotometer (ICP) (or equivalent) scan. De-ionized water obtained by other methods is acceptable, as long as it meets the above analytical criteria. Organic-free water may be substituted for de-ionized water.
- Organic-free water: Tap water that has been treated with activated carbon and de-ionizing units. At a minimum, the finished water must meet the analytical criteria of de-ionized water and it should contain no detectable pesticides, herbicides, or extractable organic compounds, and no volatile organic compounds above minimum detectable levels as determined by the Region 4 laboratory for a given set of analyses. Organic-free water obtained by other methods is acceptable, as long as it meets the above analytical criteria.
- Solvents (e.g., pesticide-grade isopropanol or other solvents) may be used for a particular investigation if needed. Pesticide-grade acetone or methanol are acceptable. However, it should be noted that if pesticide-grade acetone is used, the detection of acetone in samples collected with acetone rinsed equipment is considered suspect. Pesticide-grade methanol is much more hazardous to use than either pesticide-grade acetone or isopropanol, therefore its use is discouraged. Solvents used to clean equipment cannot be reused.

1.5 References

SESD Operating Procedure for Field Equipment Cleaning and Decontamination, SESDPROC-205, Most Recent Version

United States Environmental Protection Agency (US EPA). 2001. Environmental Investigations Standard Operating Procedures and Quality Assurance Manual. Region 4 Science and Ecosystem Support Division (SESD), Athens, GA

US EPA. Safety, Health and Environmental Management Program Procedures and Policy Manual. Region 4 SESD, Athens, GA, Most Recent Version

1.6 General Precautions

1.6.1 Safety

Proper safety precautions must be observed when field cleaning or decontaminating dirty sampling equipment. Refer to the SESD Safety, Health and Environmental Management Program (SHEMP) Procedures and Policy Manual and any pertinent site-specific Health and Safety Plans (HASP) for guidelines on safety precautions. These guidelines, however, should only be used to complement the judgment of an experienced professional. Some materials used to implement the decontamination procedures outlined in this procedure are harmful if used improperly. Caution should be exercised and all applicable safety procedures shall be followed. At a minimum, the following precautions shall be taken in the washroom during these operations:

- Safety glasses with splash shields or goggles, gloves and safety boots will be worn during all decontamination operations. A neoprene apron and neoprene gloves are also required during acid rinsing.
- All solvent rinsing operations will be conducted under a fume hood or in the open (never in a closed room).
- No eating, smoking, drinking, chewing, or any hand to mouth contact shall be permitted during decontamination operations.

1.6.2 Procedural Precaution

After decontamination, equipment should be handled only by personnel wearing clean latex gloves to prevent re-contamination.

After the decontaminated equipment is wrapped in aluminum foil and sealed in plastic, the date that the equipment was decontaminated should be written on the plastic. If the equipment was not decontaminated according to the procedures outlined in this appendix, this should also be noted on the plastic. Sampling equipment and or containers must be transported/stored separate from gasoline, oil, grease, solvents, pesticides or any other possible contaminant.

When equipment and containers used to collect samples containing oil, grease, or other hard to remove materials cannot be decontaminated using any of the procedures described in this document, they should be disposed of properly.

2 Introduction to Equipment Cleaning and Decontamination

2.1 General

Cleaning procedures included in this operating procedure are intended for use by FEC personnel for cleaning and decontaminating sampling equipment. Sampling and field equipment cleaned in accordance with these procedures must meet the minimum requirements for the Data Quality Objectives (DQOs) of the study or investigation. Deviations from these procedures should be documented in the approved study plan and field records.

2.2 Handling and Containers for Cleaning Solutions

Improperly handled decontamination solutions may easily become contaminated. Containers should be constructed of the proper materials to ensure their integrity. Following are the materials to be used for storing the specified decontamination materials:

- Soap should be kept in clean containers until use. It should be poured directly from the container.
- Solvents should be stored in the unopened original containers until used. Solvents may be applied using the low pressure nitrogen system fitted with a Teflon® nozzle, or by using Teflon® squeeze bottles.
- Tap water may be kept in tanks, squeeze bottles, or applied directly from a hose.
- De-ionized water should be stored in cleaned containers that can be closed when not being used. It may be applied from squeeze bottles.
- Organic-free water should be stored in cleaned glass, Teflon®, or stainless steel containers prior to use. It may be applied using Teflon® squeeze bottles, or directly from the system.
- Nitric acid should be kept in the glass container it is received in, and placed in squeeze bottles prior to application.

2.3 Disposal of Cleaning Solutions

Procedures for safe handling and disposition of spent decontamination solutions, including washwater, rinse water, spent acid solutions, and spent solvents are as follows:

Washwater/Rinsewater

Waters from equipment decontamination at the FEC may be disposed in the sanitary drain in the washroom. When large equipment (vehicles, augers, etc.) is washed or rinsed outside, it may go onto the ground without recovery.

Nitric Acid

Nitric acid decontamination solutions are to be diluted to a pH greater than 2.0, and flushed down the sanitary drain in the washroom.

Solvent

All solvents used should be captured, properly labeled, and stored on the premises of the FEC until arrangements for proper disposal are made. Used solvents can be classified as either "solvent for recovery" or "solvent for disposal". Solvent for recovery is that which was used at the FEC for decontamination of equipment. Solvent used for decontaminating badly contaminated equipment (e.g., tar removal, etc.) should be designated for disposal. The two groups should be labeled "For Recovery" or "For Disposal" and stored separately at the FEC.

2.4 Initial Processing of Returned Equipment

Field or sampling equipment that needs to be repaired will be identified with a "repair" tag. Any problems encountered with the equipment and specific required repairs shall be noted on this tag, as well as the date and the initials of the investigator. Field equipment or reusable sample containers needing decontamination or repairs will not be stored with clean equipment, sample tubing, or sample containers.

All unused plastic wrapped equipment, containers, and tubing will be examined when the equipment is returned from the field. Any items for which the plastic wrapping is not torn or soiled may be placed back into stock.

3 Sampling Equipment Used for Trace Organic and Inorganic Compounds

Sampling equipment used to collect samples undergoing trace organic and/or inorganic constituent analyses should be thoroughly decontaminated. The following procedures are to be used.

3.1 Standard FEC Decontamination Procedure

1. Wash equipment thoroughly with soap and hot tap water using a brush or scrub pad to remove any particulate matter or surface film.
2. Rinse equipment thoroughly with hot tap water.
3. Rinse equipment thoroughly with organic-free water.
4. Allow to air dry for at least 24 hours.
5. Wrap equipment in one layer of aluminum foil. Roll edges of foil into a "tab" to allow for easy removal. Seal the foil wrapped equipment in plastic and label.

3.2 Procedures for Decontaminating Glass Pans at the FEC

1. Wash equipment thoroughly with soap and hot tap water using a brush or scrub pad to remove any particulate matter or surface film.
2. Rinse equipment thoroughly with hot tap water.
3. Rinse equipment with 10 percent nitric acid solution. Small and awkward equipment such as vacuum bottle inserts and well bailer ends may be soaked in the nitric acid solution instead of being rinsed with it. Fresh nitric acid solution should be prepared for each decontamination session.
4. Rinse equipment thoroughly with organic-free water.
5. Allow to air dry for at least 24 hours.
6. Wrap equipment in one layer of aluminum foil. Roll edges of foil into a "tab" to allow for easy removal. Seal the foil wrapped equipment in plastic and label.

4 Automatic Wastewater Sampling Equipment

4.1 Automatic Samplers

1. The exterior and accessible interior (excluding the waterproof timing mechanism) portions of the automatic samplers will be washed with soap and tap water then rinsed with tap water.
2. Desiccant in the flow meters should be checked and replaced, if necessary, each time the equipment is decontaminated.
3. The face of the timing case mechanism will be cleaned with a clean damp cloth.
4. Tubing (sample intake and pump tubing) will be discarded after each use and new Silastic® pump tubing will be installed.

4.2 Distributor Arm

1. Clean with hot tap water, soap, and a brush.
2. Rinse thoroughly with de-ionized water.
3. Replace in sampler.

4.3 All Automatic Sampler Headers

1. Disassemble header and using a bottle brush, wash with hot tap water and soap.
2. Rinse thoroughly with de-ionized water.
3. Dry thoroughly, then reassemble header and wrap with aluminum foil.
4. Seal in plastic.

4.4 Reusable Composite Sample Containers

1. Wash containers thoroughly with hot tap water and soap, using a bottle brush to remove particulate matter and surface film.
2. Rinse containers thoroughly with hot tap water.
3. Rinse containers with at least 10 percent nitric acid.

4. Rinse containers thoroughly with tap water.
5. Rinse containers thoroughly with de-ionized water.
6. Air dry.
7. Cap with aluminum foil or Teflon® film.

4.5 Glass Sequential Bottles for GC/MS Analyses

1. Rinse with 10 percent nitric acid.
2. Rinse thoroughly with tap water.
3. Wash using soap, followed by tap and de-ionized water rinses.
4. Air dry.
5. Replace in covered, automatic sampler base; cover with aluminum foil for storage and mark the base as follows: "Cleaned for organic analyses."

4.6 Reusable Teflon® Composite Mixer Rods

1. Wash equipment thoroughly with soap and hot tap water using a brush or scrub pad to remove any particulate matter or surface film.
2. Rinse equipment thoroughly with hot tap water.
3. Rinse equipment thoroughly with tap water.
4. Rinse equipment thoroughly with de-ionized water.
5. Air dry.
6. Wrap equipment in one layer of aluminum foil. Roll edges of foil into a "tab" to allow for easy removal. Seal the foil wrapped equipment in plastic and label.

5 Procedures for Tubing

5.1 Silastic® Pump Tubing

The Silastic® pump tubing in the automatic samplers and peristaltic pumps should be replaced after each study. After installation, the exposed ends should be capped with clean, unused aluminum foil.

5.2 Teflon® Sample Tubing

Use only new Teflon® tubing which has been pre-cleaned as follows for the collection of samples for trace organic compound or ICP analyses:

1. Teflon® tubing shall be precut to required lengths – e.g. 10, 15 or 25-foot lengths
2. Flush interior of tubing with organic-free water
3. Purge tubing with nitrogen until visibly dry.
4. Coil and wrap tubing in one layer of aluminum foil. Roll edges of foil into a "tab" to allow for easy removal. Seal the foil wrapped tubing in plastic and label.

6 Procedures for Miscellaneous Equipment

6.1 Well Sounders or Tapes

1. Wash with soap and tap water.
2. Rinse with hot tap water.
3. Rinse with de-ionized water.
4. Allow to air dry overnight.

6.2 Redi-Flo2 Pump

CAUTION - Do not wet the controller.

Controller Box Decontamination:

1. Wipe the controller box with a damp cloth. Immediately remove any excess water.
2. Let the controller box dry completely.

Pump Decontamination:

1. Remove garden hose (if attached) and ball check valve. Decontaminate these items separately.
2. Using a brush or scrub pad, scrub the exterior of the electrical cord and pump. Run the soap and tap water solution through the pump. Do not wet the electrical plug.
3. Place the pump in tap water and flush into a bucket or other container to clean the inside of the pump. Then run de-ionized water through the pump and flush out the tap water rinse and any soap residue.
4. Completely air dry.
5. Place the pump in clean plastic bag.

To decontaminate the Redi-Flo2® ball check valve:

1. Remove the ball check valve from the pump head. Check for wear and/or corrosion, and replace as needed.
2. Using a brush, scrub all components with soap and tap water.
3. Rinse with organic-free water.
4. Completely air dry.
5. Replace the ball check valve to the Redi-Flo2® pump head.

Note: The de-ionized or organic-free water within the Redi-Flo2® pump head should be replaced at the FEC after decontamination and prior to storage or re-use.

6.3 Drill Rig, Grout Mixer, and Associated Equipment

Upon return to the FEC, drilling equipment must be cleaned, as follows:

- A thorough interior and exterior cleaning of the drill rig is required at the end of each study. At a minimum, the exterior should be cleaned with a steam jenny.
- If the pump is used to circulate mud rotary drilling fluids or bentonite grout, the pump and tank on the drill rig should be flushed with tap water until clear, and then drained.
- The pump on the grout mixer should be flushed with tap water until clear, then drained.
- The grout mixer should be washed with soap and tap water. The steam jenny may be used.

Drilling equipment (tools, rods, augers, etc.) shall be decontaminated as follows:

1. Inspect thoroughly. If severe rust, corrosion, paint, or hardened grout is present the equipment may require sandblasting prior to decontamination.
2. Wash with tap water and soap, using a brush if necessary, to remove particulate matter and surface films. Steam cleaning (high pressure hot water with soap) may be necessary to remove matter that is difficult to remove with the brush. Drilling equipment that has been steam cleaned should be placed on racks or saw horses at least two feet above ground. Hollow-stem augers, drill

rods, etc., that are hollow or have holes that transmit water or drilling fluids, should be decontaminated on the inside and outside.

3. Rinse thoroughly with tap water.
4. Let completely air dry. Remove and cover with clean, unused plastic and label.

At the direction of the project leader, Quality Assurance Officer, or drill rig operator, this equipment may be decontaminated as specified in Section 3.1 prior to use.

6.4 Field Analytical Equipment

Field instruments for in-situ water analysis should be wiped with a clean, damp cloth or sponge. The probes on these instruments (pH, conductivity, DO, etc.), should be rinsed with de-ionized water and air dried.

Any desiccant in these instruments should be checked and replaced, if necessary, each time the equipment is decontaminated.

6.5 Ice Chests and Shipping Containers

Ice chests and reusable containers shall be washed with soap (interior and exterior) and rinsed with tap water and air dried before storage. If, in the opinion of the field investigators, the container is severely contaminated with concentrated waste or other toxic material, it shall be cleaned as thoroughly as possible, rendered unusable, and properly disposed.

6.6 Organic-Free Water and De-ionized Water Storage Containers

NOTE: These containers will be used only for transporting organic-free or de-ionized water.

1. Wash containers thoroughly (interior and exterior) with hot tap water and soap, using a bottle brush to remove particulate matter and surface film.
2. Rinse containers thoroughly with hot tap water.
3. Rinse containers with at least 10 percent nitric acid.
4. Rinse containers thoroughly with tap water.

5. Rinse containers thoroughly with de-ionized water.
6. Allow to air dry and secure with tightly fitting cap.

When transporting organic-free and de-ionized water to the field, use only containers cleaned as specified above. Label the container as "organic-free water" or "de-ionized water" and include the date it was prepared.

6.7 SCBA Facemasks

CAUTION: Facemasks should be inspected for wear or damage. If, after consultation with the Safety Officer, the facemask cannot be repaired, it should be discarded.

1. Wash facemask thoroughly inside and out with hot tap water and soap. Use only soft brushes. Do not use scouring pads of any type.
2. Rinse facemask thoroughly inside and out with tap water.
3. Hang facemask up until completely dry.
4. Place facemask in plastic bag and return to SCBA case.

APRs are completely dismantled prior to cleaning. Then Steps 1 - 3 for SCBA facemasks are used. When completely dry, the APR is reassembled and placed in a plastic bag.

6.8 Garden Hose

1. Brush exterior with soap and tap water
2. Rinse with tap water.
3. Flush interior with tap water until clear (minimum of one gallon) and drain.
4. Let completely air dry.
5. Coil and place in clean plastic bag.

6.9 Portable Tanks for Tap Water

1. Scrub interior and exterior with soap and tap water.
2. Rinse with tap water.

3. Let completely air dry.
4. Close.

6.10 Vehicles

Vehicles utilized by field investigators should be washed (if possible) at the conclusion of each field trip. This should minimize contamination of equipment or samples due to contamination of vehicles.

When vehicles are used in conjunction with hazardous waste site inspections, or on studies where pesticides, herbicides, organic compounds, or other toxic materials are known or suspected to be present, a thorough interior and exterior cleaning is mandatory at the conclusion of such investigations. It shall be the responsibility of the field investigators to see that this procedure is followed.

Field investigators are responsible for keeping field vehicles clean by removing trash and other debris. Contaminated trash and equipment should be kept separate from ordinary trash and should be properly disposed on-site or upon return.

7 Preparation of Disposable Sample Containers

7.1 Introduction

No disposable sample container may be reused. All disposable sample containers will be stored in their original packing containers. When packages of uncapped sample containers are opened, they will be placed in new plastic garbage bags and sealed to prevent contamination during storage.